

Washington State Department of Transportation (WSDOT) Fish Passage Program

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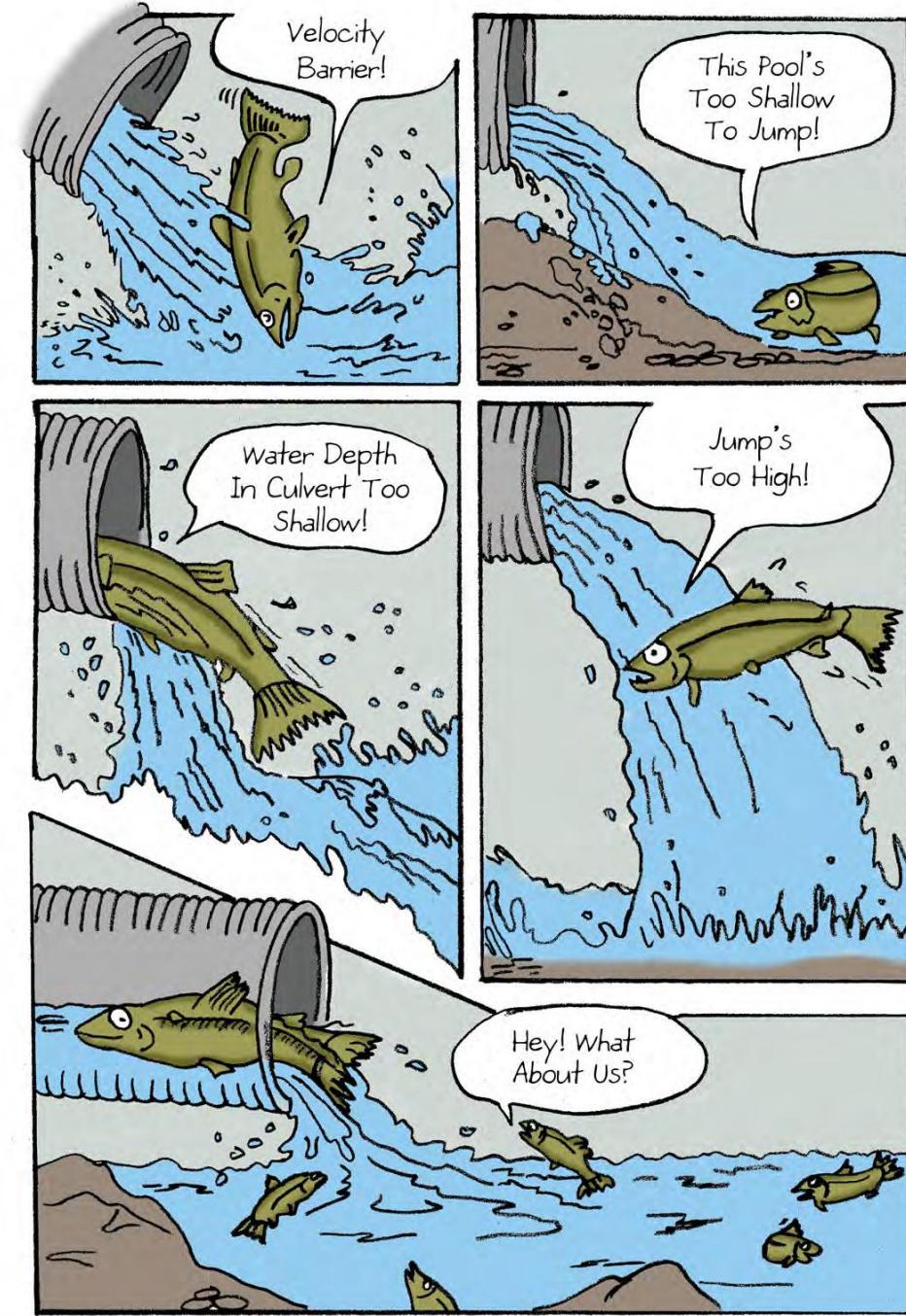
South Sound Estuary Association
October 20, 2016

Fish Passage at Highway Culverts

- WSDOT is responsible for –
 - 7,056-mile long highway system
 - >3,600 crossings of fish bearing streams
- WSDOT recognizes –
 - Poorly designed/installed culverts can delay or block fish access to habitat.
 - Culverts can fail over time and become fish barriers.



What makes a fish passage barrier?



Fish Passage Barrier Culvert Conditions:

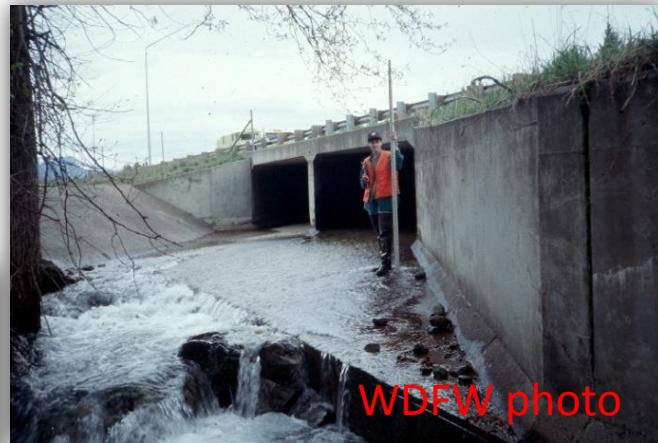


Kitsap Sun photo

Excessive Water Surface Drop



High Velocity



WDFW photo

Shallow Water Depth



WDFW photo



WDFW photo



WDFW photo



Washington State
Department of Transportation

Other Fish Passage Barrier Conditions:



Trash Racks
and Flap Gates



Culvert Plugged with
Sediment or Debris



Deteriorating
Culverts



WDFW photos



WSDOT Fish Passage Program

- Partnership with WDFW starting early 1990's
- Fish barrier inventory & prioritization
- Statewide: 7,143 water crossings inspected
 - 3,623 were identified as fish bearing waters
 - About 2,000 fish barriers identified



Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual

2009



WASHINGTON DEPARTMENT OF
FISH & WILDLIFE

HABITAT PROGRAM

Technical Applications (TAPPS) Division



- Updated in 2009
- Fish Passage Features
 - Road Crossings
 - Dams
 - Fishways
 - Natural Barriers
- Surface Water Diversions
- Habitat Assessment
- Prioritization



<http://wdfw.wa.gov/publications/pub.php?id=00061>

How WSDOT corrects its fish passage barriers

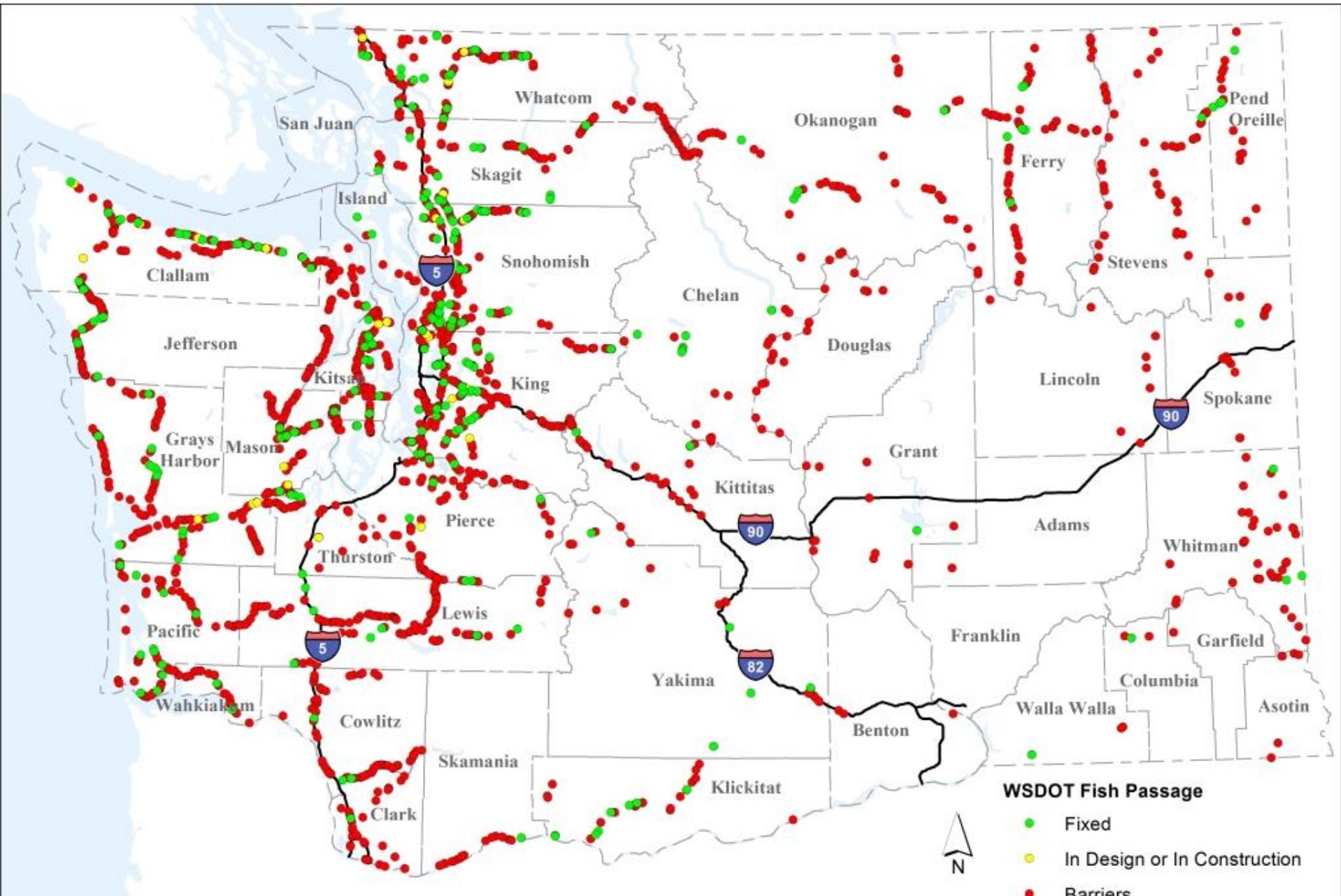
- By constructing stand-alone fish passage projects using dedicated funding.
- Through safety and mobility road construction projects.
- And during other road maintenance projects when heavy equipment is already mobilized in the area.



Fish Passage Barrier Correction

- In 1991 WSDOT developed a program to
 - identify high priority barriers,
 - correct barriers with dedicated fish passage funds, and
 - correct barriers during transportation projects
- As of July 2016, WSDOT has
 - completed 301 projects opening up 1,000 miles of potential upstream habitat.

20 additional barriers were corrected in 2016



Prioritizing Culverts for Correction

Factors include:

- **Habitat Gain** – quality and quantity
- **Severity of the barrier**
- **Species presence** – number that benefit from the habitat
- **Endangered Species Act species** – presence and number
- **Cost of the project** – barrier correction costs cover a wide range: from solutions that modify existing culverts to those that replace a culvert with a bridge
- **Coordination** with others



Culvert Case

US v WA Background

- **1850's Stevens Treaties:** Tribes ceded lands; reserved fishing rights.
- **1974 Boldt Decision:** Treaties entitle Tribes to a fair share of fish, while ensuring habitat that supports fish.
- In **2001**, Twenty-one Western WA Tribes filed **suit against the State** claiming culverts were blocking substantial amounts of salmon habitat, thus reducing the salmon available for harvest.
- In **2007**, Federal District Court **Judge Martinez agreed to the claim** and said the State was in breach of the Tribes' treaty rights.
- In **October 2009**, the **court convened a trial** to determine what the remedy should be.
- On **March 29, 2013**, Judge Martinez issued a permanent **injunction** for the State to accelerate barrier correction within the case area.

US v. WA Culvert Injunction

March 2013

Who? State of Washington
WSDOT, WDNR, WDFW, Parks

Where? Case area
Western Washington WRIA's 1-23



Area subject to culvert injunction.

How many WSDOT barrier culverts?

About 980 total including (as of August 2015)

About 818 with Significant Habitat (>200 m upstream)

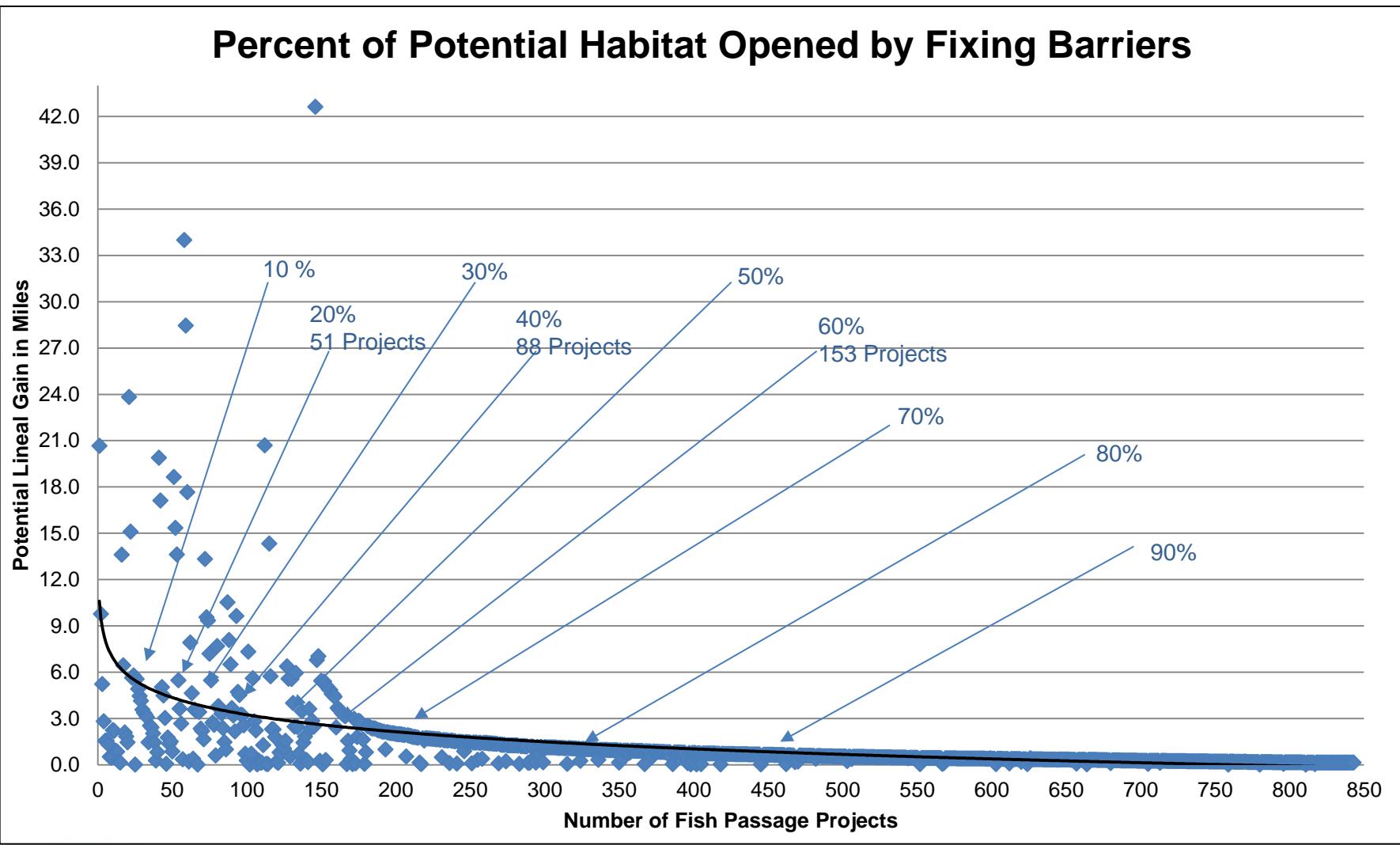
** Corrected 21 injunction barriers since 2013*

** Correcting 20 injunction barriers in 2016*

Injunction Requirements

- Fix WSDOT barriers blocking 90% of potential upstream habitat by March 2030.
- Correct culverts with <200 meters of upstream habitat at the end of their useful life or sooner as part of larger transportation projects.
- Bridge or stream simulation culvert corrections.
- Ongoing efforts to identify and assess barriers, monitor effectiveness, and maintain culverts.
- Coordinate all efforts with tribes.

Culverts Block varied amounts of habitat



Injunction Barrier Correction Standards

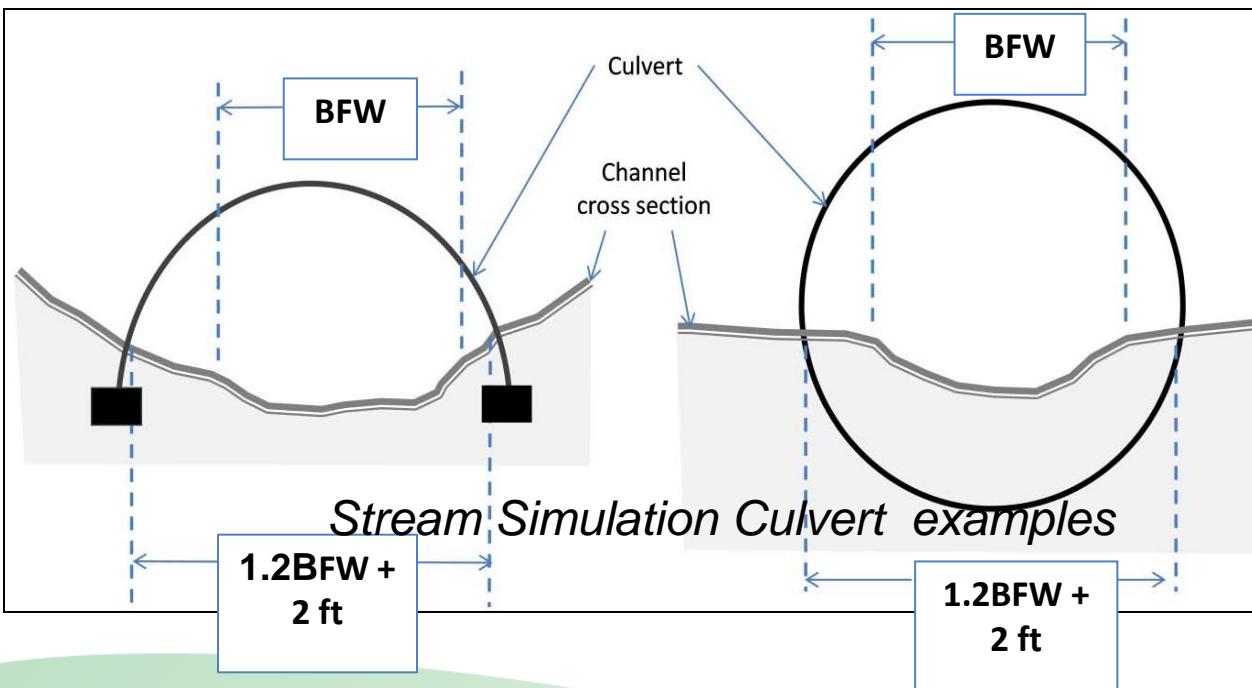
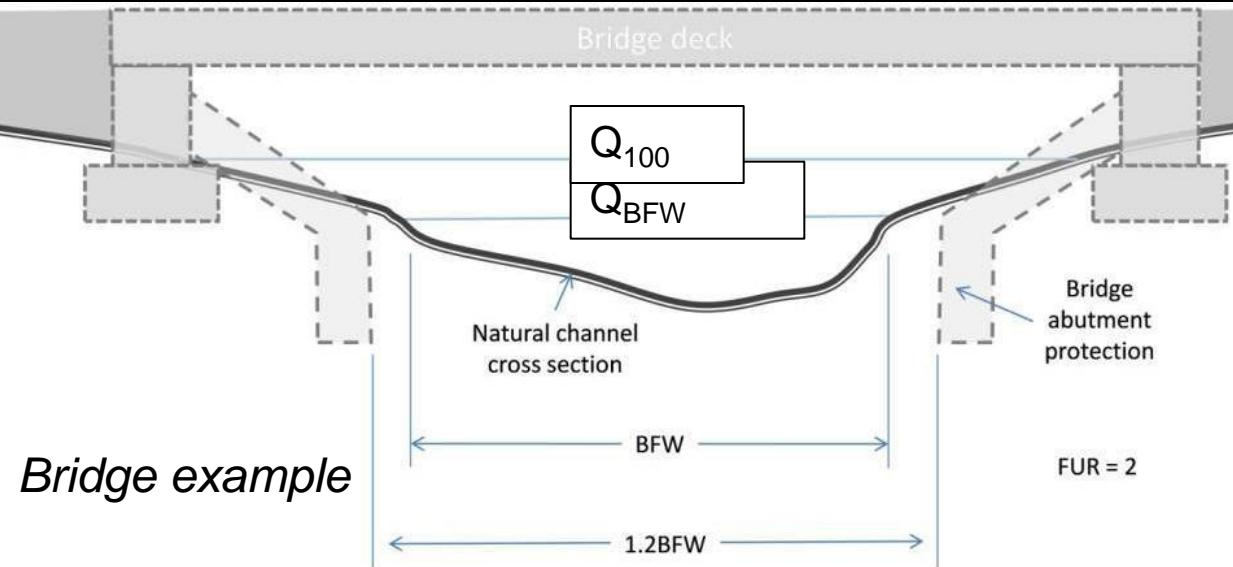
- **Bridges** – full channel spanning bridges facilitate habitat connection for fish and wildlife
- **Stream Simulation** – mimics natural stream channel processes throughout the culvert



Bridge



Stream Simulation Culvert



Stand-alone Fish Passage Barrier Correction Project



BEFORE: SR 530 Fortson Creek, west of Darrington. Previous culvert had excessive outfall drop



AFTER: Fortson Creek with new stream simulation crossing

Before

Stand-alone Barrier Correction Project

SR 99 WF Hylebos Creek



6 ft box with deficient fishway

- \$2.6 M cost
- 2 miles habitat gain
- Chum, coho, steelhead, coastal cutthroat, & resident trout



During

After

New 20 ft wide structure



**Washington State
Department of Transportation**

SR 99 Hylebos Creek -year one 2016

Corrections as part of a larger transportation project: SR 520



Correction as part of a project: SR 520 WB off-ramp Yarrow Creek



Before: 3.5' x 2.5' squash culvert

- Part of larger transportation project
- 2.8 miles habitat gain
- Sockeye, coho, steelhead, resident trout



After: 16' box

Chronic Environmental Deficiency Project: SR 203 Coe Clemons Creek



Undersized culvert regularly plugged with debris requiring maintenance



After: culvert replaced with a 25 ft wide stream simulation culvert

<https://www.youtube.com/watch?v=nMixgoOOSoQ>

What makes a successful fish passage project?

Built according to plans:

- ★ Bed material right size, well-graded, well-placed
- ★ Critical elevations verified
- ★ Proper wood placement
- ★ Other habitat elements



Fish Passage Monitoring

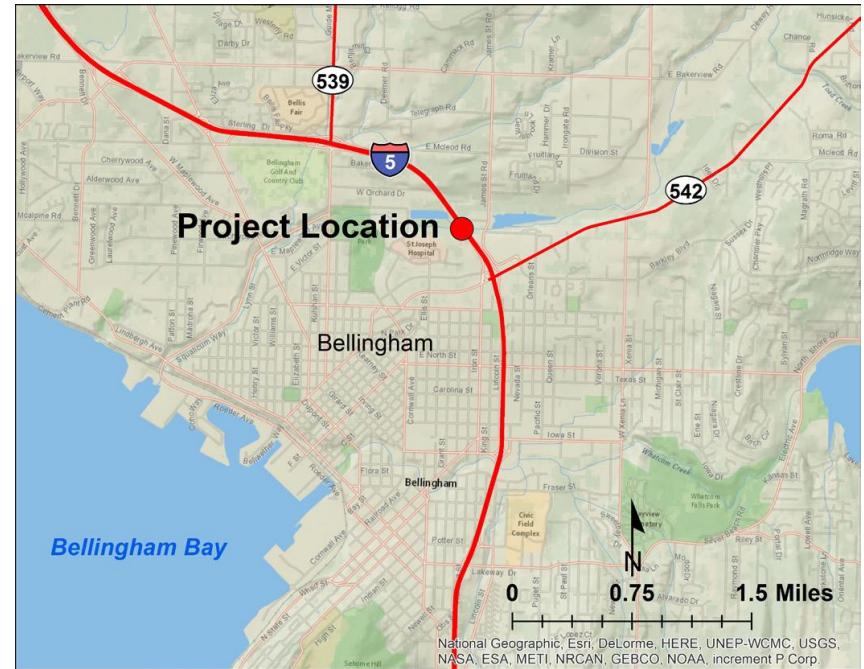


Fish Passage Coordination

- WSDOT coordinates barrier correction efforts with private landowners, enhancement groups, state and local governments, tribes other entities.
- Fish Passage Barrier Removal Board in Washington
 - 2014 Legislation, HB 2251
 - WDFW, WSDOT, DNR, Governor's Salmon Recovery Office, Tribes, local governments participate
 - Purpose is to develop statewide strategy based on maximizing habitat recovery through a coordinated, watershed approach
 - Streamlined permitting for fish passage projects

Partnership Example: I-5 Squalicum Creek

- WSDOT partnered with the City of Bellingham, WDFW, the WA Department of Ecology, and others to restore Squalicum Cr, which flows to Bellingham Bay.
- In 2013, WSDOT constructed an open, fish-friendly culvert to protect the existing I-5 bridges.
- In 2015, the stream was re-routed by the City of Bellingham under the I-5 bridges into an old, historic channel.
- This project will open up ~22 miles (35 km) salmon habitat.



Before – twin culverts are a velocity barrier



After – stream flows through open culvert

SR 548 Terrell Creek



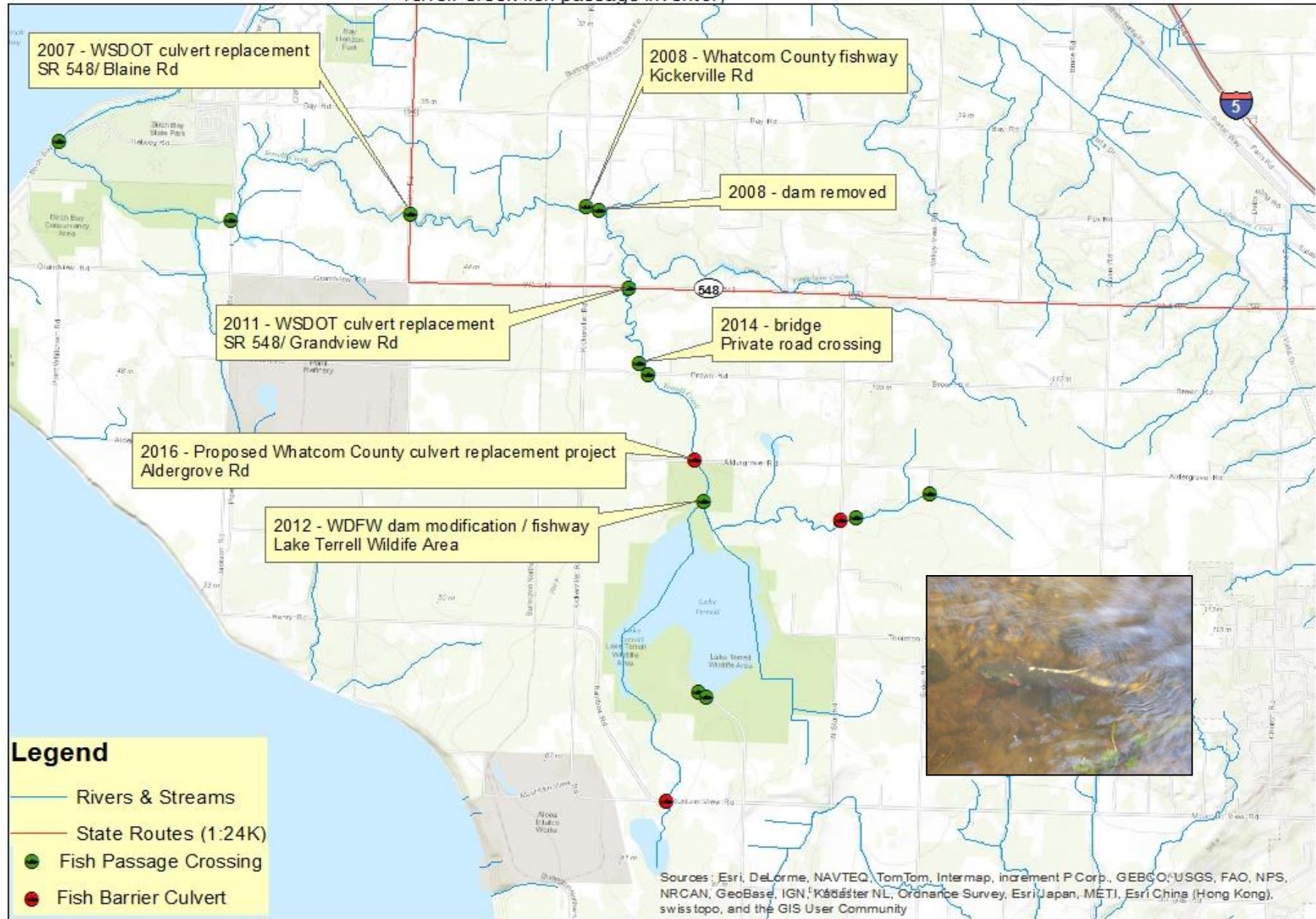
After construction – 2011



3 years after construction – 2014

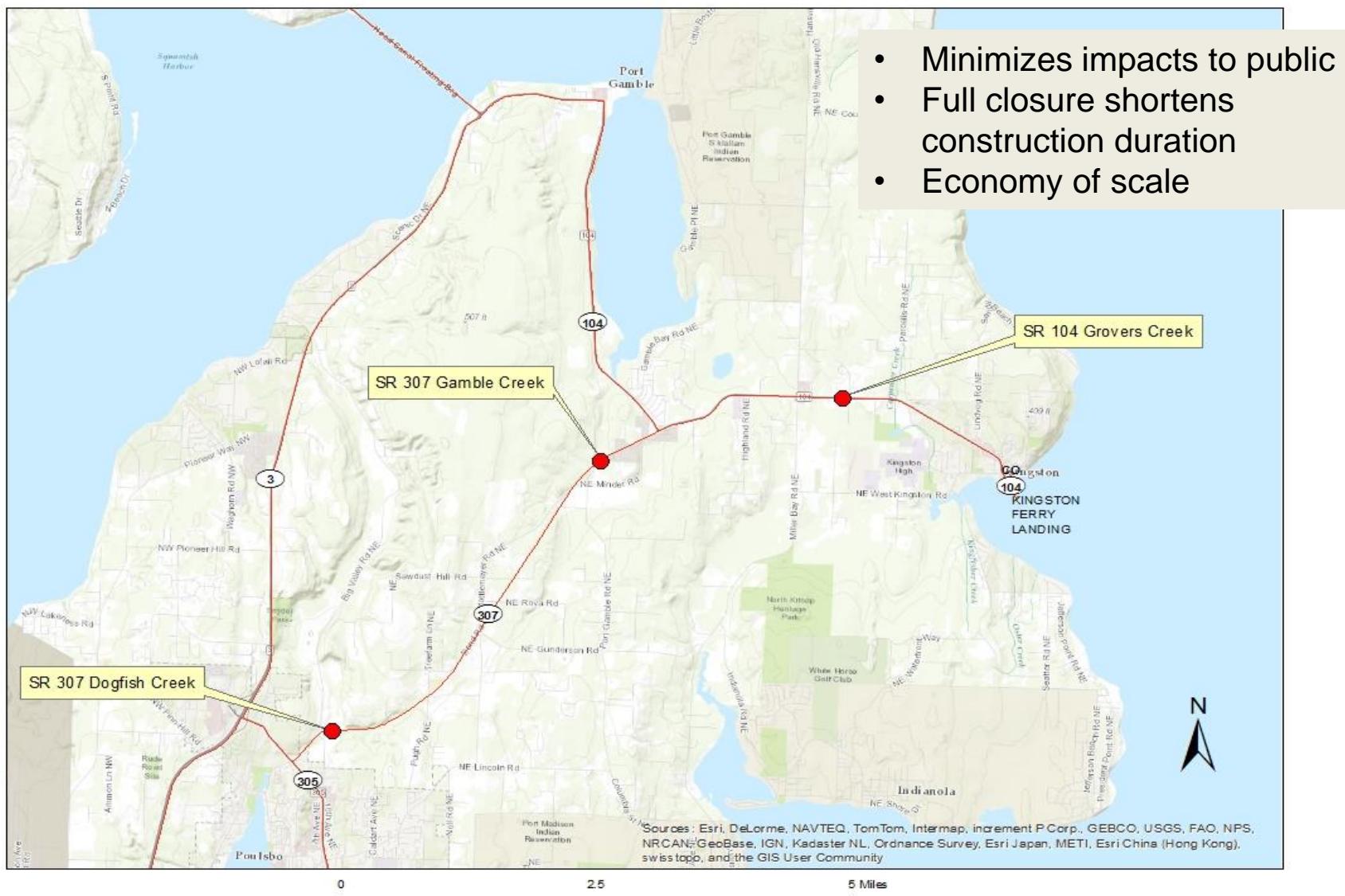
- Good installation
- Dry bank most flows
- Natural streambed
- Still performing well

Terrell Creek fish passage inventory



Project Bundling Example – Kitsap Peninsula

- Minimizes impacts to public
- Full closure shortens construction duration
- Economy of scale





SR 3 Twanoh Creek under Construction



Washington State
Department of Transportation



SR 104 Grovers Creek, 2016



Washington State
Department of Transportation



SR 307 Gamble Creek 2016



**Washington State
Department of Transportation**



SR 307 Dogfish Creek Before

2016





You are here: [Home](#) > [Agency Projects](#) > [Fish Passage](#)

Project Info

- [Home](#)
- [Coordinating with Others](#)
- [Costs for Fish Barrier Removal](#)
- [Determining Culvert Repair Priorities](#)
- [Environmental Stewardship](#)
- [Federal Court Injunction](#)
- [Fish Barrier Correction Construction Process](#)
- [Frequently Asked Questions](#)
- [Fish Passage Responsibilities](#)
- [Culverts as Barrier to Fish](#)
- [Number of Fish Barriers](#)
- [Fish Passage Contacts](#)
- [Working with Partners](#)

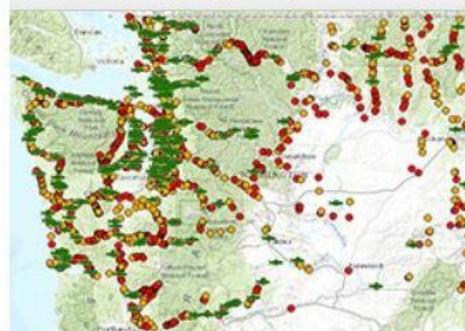
Publications

- [Barrier Correction Folio \(pdf 1 mb\)](#)
- [2014 Annual Fish Passage Report \(pdf 9.7 mb\)](#)

Fish Passage

State highways cross hundreds of streams and rivers in Washington. At many of those locations, culverts are too small or otherwise inadequate to allow fish to migrate upstream and downstream as necessary for growth and reproduction. WSDOT has been working for more than two decades to correct these inadequate culverts to improve fish habitat.

Find Fish Passage Projects



Before Photo



US 97 culvert that blocked fish passage at Butler Creek, a tributary to the Little Klickitat River near Goldendale.

After Photo



US 97 at Butler Creek after the \$3.5 million barrier removal project was completed in April 2013.

Why is WSDOT fixing fish barriers?

- [Environmental Stewardship Related to Fish Passage](#)
- [Fish Passage Responsibilities](#)
- [Federal Court Injunction Related to Fish Passage](#)

What makes a fish barrier?

Fish Passage Partners



Questions or Comments?



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WSDOT Fish Passage Program

Comprehensive
Fish Passage
Inventory
1991-present

- Washington Department of Fish & Wildlife (WDFW) inventories fish passage barriers on WSDOT Highways.
- WDFW conducts Habitat Assessments to help prioritize barrier correction efforts.

Fish Passage
Inventory
Database

- WDFW maintains central data repository for culvert, GIS, fish use, and habitat information resulting from inventories.
- WSDOT prioritize, select, implement, and monitor fish passage projects.

Dedicated Fish
Passage
Barrier
Removal
Program

- Stand-alone Projects (Dedicated Funding)
- Chronic Environmental Deficiency (CED) and Major Drainage
- Safety and Mobility Projects (larger transportation projects)
- Other partnerships and Grant Funding

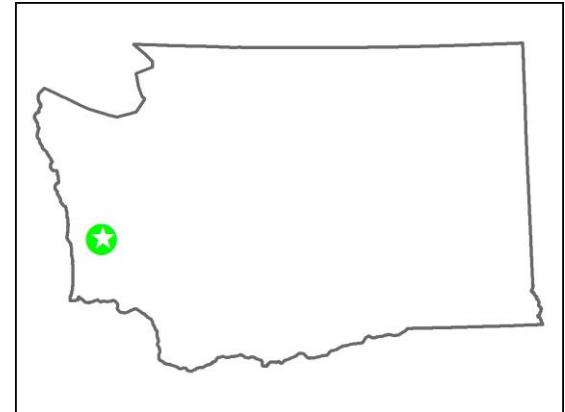
Wildlife Passage: an added benefit



Before – 1.22 meter (4 ft)



After – 4.9 meter (16 ft) constructed in 2009



US 101 south of Aberdeen, WA



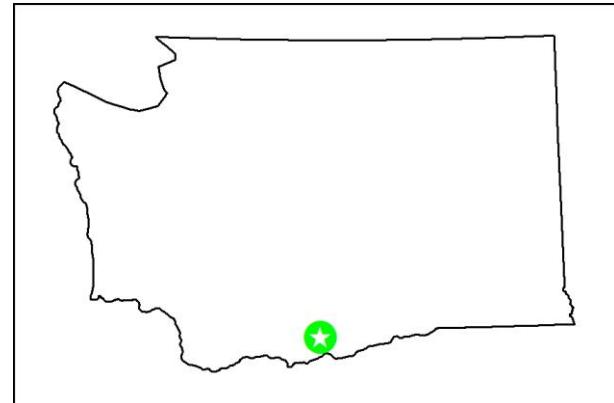
US 101- Mosquito Creek

Wildlife Passage Benefits



Before – 3.2 meter (10.5 ft)

US 97 - Butler Creek



Goldendale, WA



US 97 - Butler Creek



After – 19.8 meter (65 ft) bridge
constructed in 2012



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SR 16 Anderson Creek